



The World Bank

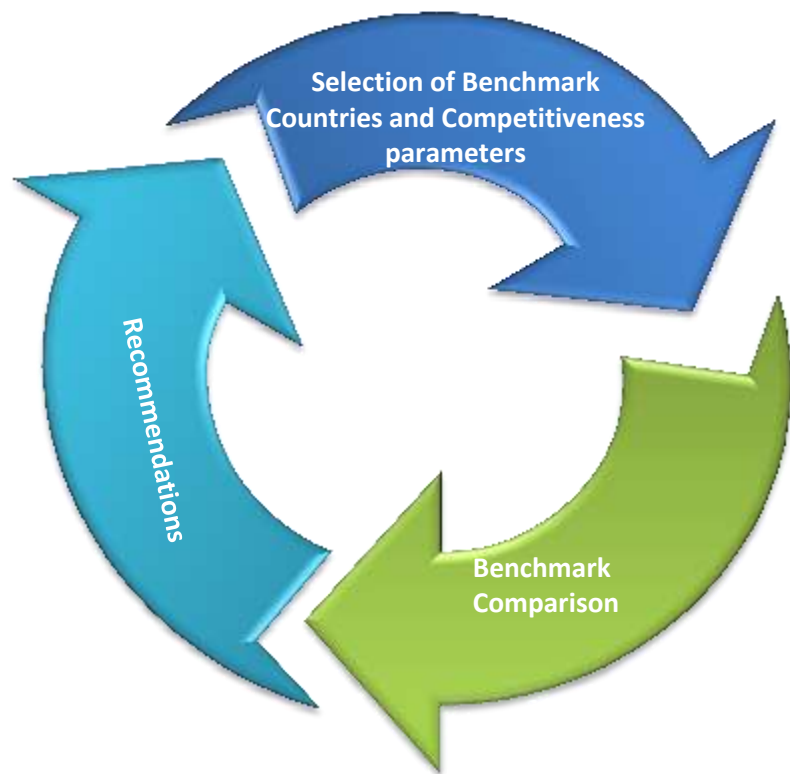
Competitiveness Assessment of MENA countries to Develop a Local Solar Industry

**Menarec
May 2012**



The World Bank

A study is currently in progress to determine the Competitiveness of MENA countries to build a local solar CSP and PV component industry

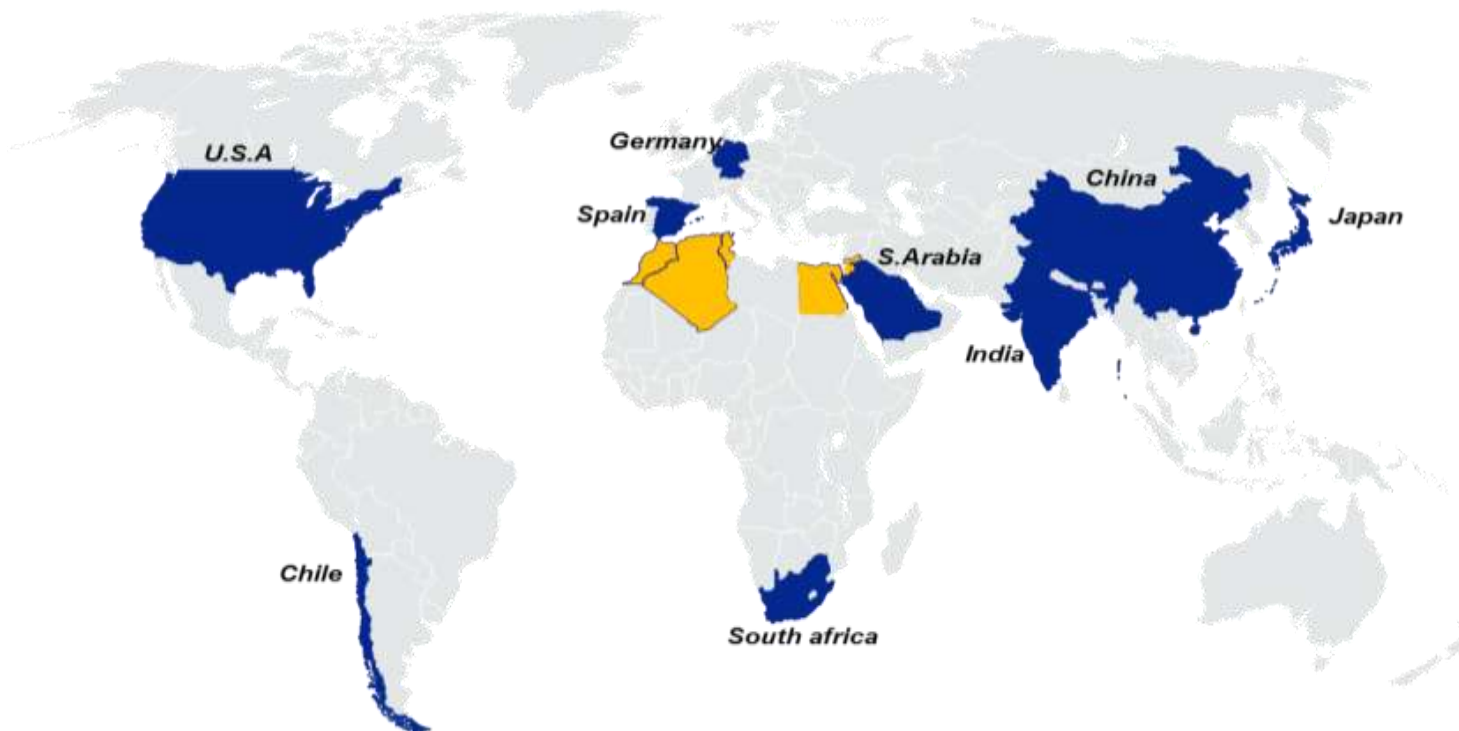
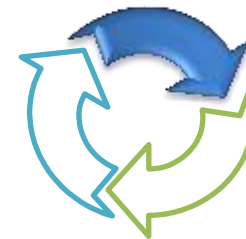


- This study is the continuation of the study that the **World Bank commissioned last year**, “MENA Assessment of the Local Manufacturing Potential for Concentrated Solar Power Projects”.
- The current study, which is financed by the **Norwegian Trust Fund for Private Sector and Infrastructure (NTF-PSI)** and the **Energy Sector Management Assistance Program (ESMAP)**, represents the **commitment** on the part of the **World Bank** and these organizations to support the MENA countries in the development of opportunities around solar energy.
- The study focuses on five MENA countries : **Algeria, Egypt, Jordan, Morocco and Tunisia**, and, from the basis of a **benchmark analysis** with nine other countries, looks at how specifically these countries can **improve their competitiveness, support local capacity building, and attract investments to develop a competitive solar industry**.
- A **report and a dissemination workshop** are planned in the future, but today, we already have **some preliminary results** we would like to share with you.



The World Bank

The benchmark countries were selected on the basis of current and future potential and geographical location



Representative countries within the region	
> North America	
> Latam	
> Europe	
> Asia	
> Southern Africa	
Representative countries within the MENA region	

- The countries were selected based on: **expert knowledge**, **experience in the solar industry**, **future potential**, and **geographical location**, ensuring representation by all major regions of the world.

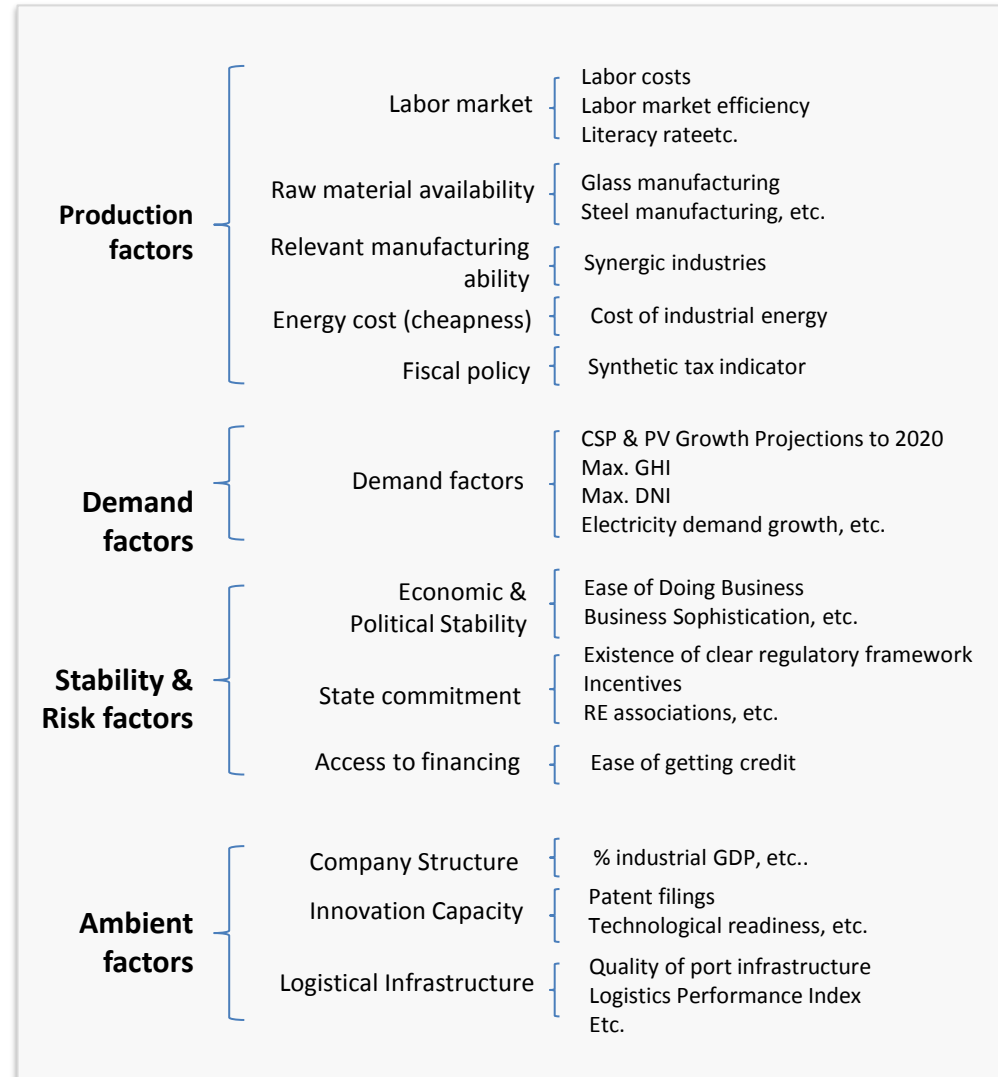


The World Bank

The competitiveness parameters were selected on the basis of their significance for solar industry development



- The selection of the 12 competitiveness parameters, loosely based on Porter's Diamond Framework, is based on past experience and expert advice.
- Each competitiveness parameter is composed of a series of metrics.
- The competitiveness parameters are then aggregated into four broad categories:
 - Production factors
 - Demand factors
 - Stability & Risk factors
 - Ambient factors





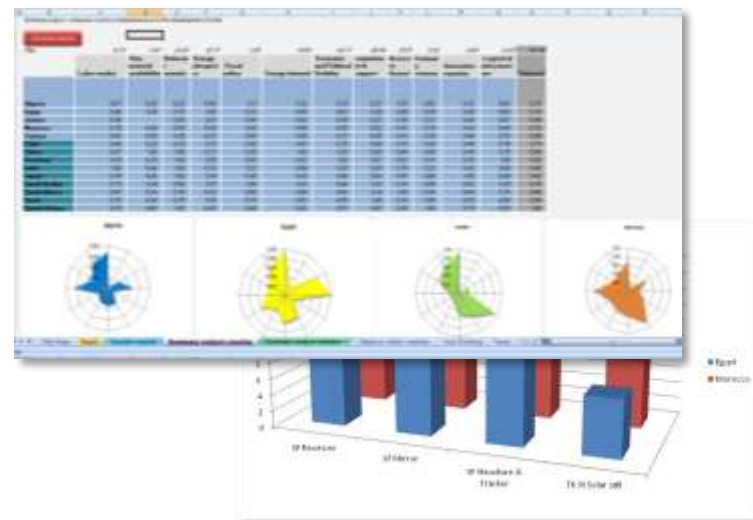
The World Bank

An empirical model was set up to perform the benchmark comparison



- A **weighting** was assigned to each parameter for each technology and, when applicable, for each relevant industry within each technology, according to each parameter's impact on each component of the solar value chain.

- Aims to be flexible and adaptable in time
- Allows for two types of results:
 - **Global competitiveness by country**
 - **Competitiveness by technology and, within each technology, by relevant solar industry**



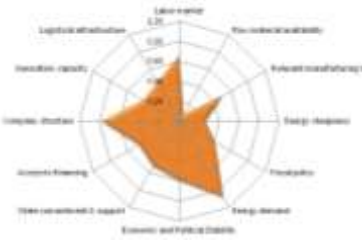
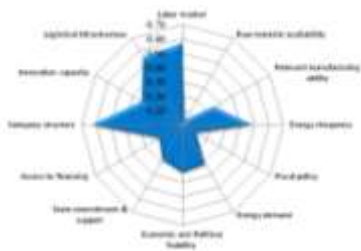


The World Bank

Countries have built the solar industry on different strengths, but certain key factors emerge



- 1. Political engagement and commitment.** A clear, stable regulatory framework for renewable energy that takes into account project risks and ensures an acceptable return for investments is essential.
- 2. Local demand.** Sufficient local demand is required to kickstart the industry, even if exports are part of the future plan.
- 3. Access to financing.** Every effort needs to be made to find ways of facilitating access to financing and to communicate the potential of the CSP and PV market to domestic & international investors, banks, and other players.
- 4. Training and engineering capabilities.** A trained labor force, with engineering and sector-specific capabilities, represents a significant asset.



<ul style="list-style-type: none"> • Low energy cost • Float glass manufacturing capacity • Steel manufacturing capacity • Second-highest DNI and GHI in the region • Ambitious CSP and PV targets to 2020 	<ul style="list-style-type: none"> • Low labor cost • Low energy cost • Float glass manufacturing capacity • Steel manufacturing capacity • High electricity demand growth • High ratio of patent filings per million population • Access to financing 	<ul style="list-style-type: none"> • Low labor cost • Technological readiness • High innovation score • Progressive fiscal policy • Net energy importer • Renewable Energy Law 2010 	<ul style="list-style-type: none"> • Steel manufacturing capacity • Copper manufacturing • Significant energy imports • Presence of large international industrial players • Ambitious RE targets • Port infrastructure quality 	<ul style="list-style-type: none"> • Technological readiness • Progressive fiscal policy • Access to financing • Efficient port infrastructure
---	---	---	---	--



Preliminary Results of the Analysis: Structure and CSP Component development in Morocco



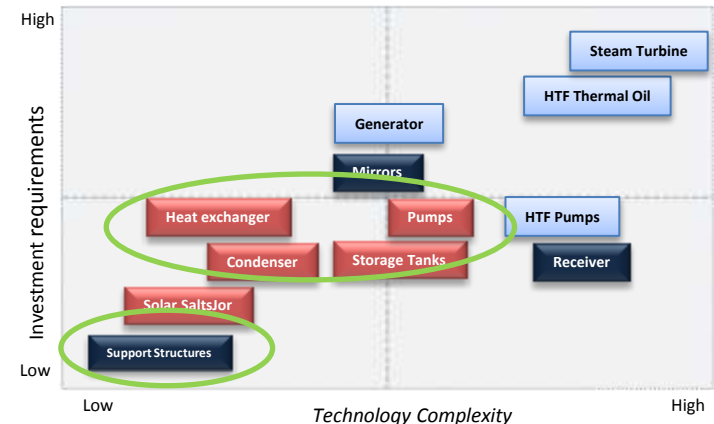
In the short term, Morocco has the chance to position itself as a leader in:

- **development of both CSP and PV Structures** (10-15% of total wealth of the component value chain), due to:
 - **Strong local steel manufacturing industry**, already producing multiple types of products for different sectors
 - **Low labor costs**
 - Proximity to Europe and an important existing **export relationship to Europe** (52% of total exports)
- the development of **storage tanks, pumps, condensers and heat exchangers** (approximately **20% of total wealth** of the component value chain) which are only likely to develop in countries with existing related industries
- Working together with international solar companies to define exact specifications



Planned local CSP and PV demand to 2020 is enough to kickstart the development of these industries

Complexity and Investment Requirements for the CSP Solar Industry





The World Bank

Preliminary Results of the Analysis: CSP Mirrors and PV Solar Glass Development in Egypt



- Egypt **could position itself as a leader in the region for the development of mirrors for CSP and solar glass for Thin-Film and Crystalline PV** due to:
 - A developed flat glass industry (production and transformation),
 - Competitive labor and energy costs
- To differentiate itself from competition from other regions, Egypt could **focus on glass designed to meet the specifications and conditions** of the region (e.g. Sahara desert)
- Although Egypt has **ambitious renewable energy targets** (20% of electricity by 2020), solar aspirations are more modest.
- Local demand would have to be **supplemented by regional exports**



Development of the industry could be successful in a scenario where local CSP and PV demand to 2020 are supplemented by demand from the rest of MENA.



For CSP systems, extra clear glass and mirrored glass are used to redirect maximum amounts of light towards the focal point



In Crystalline PV glass acts as a protective outer layer. In thin-film PV, solar cells are deposited as a sequence of thin films on glass

accenture
High performance. Delivered.

STA

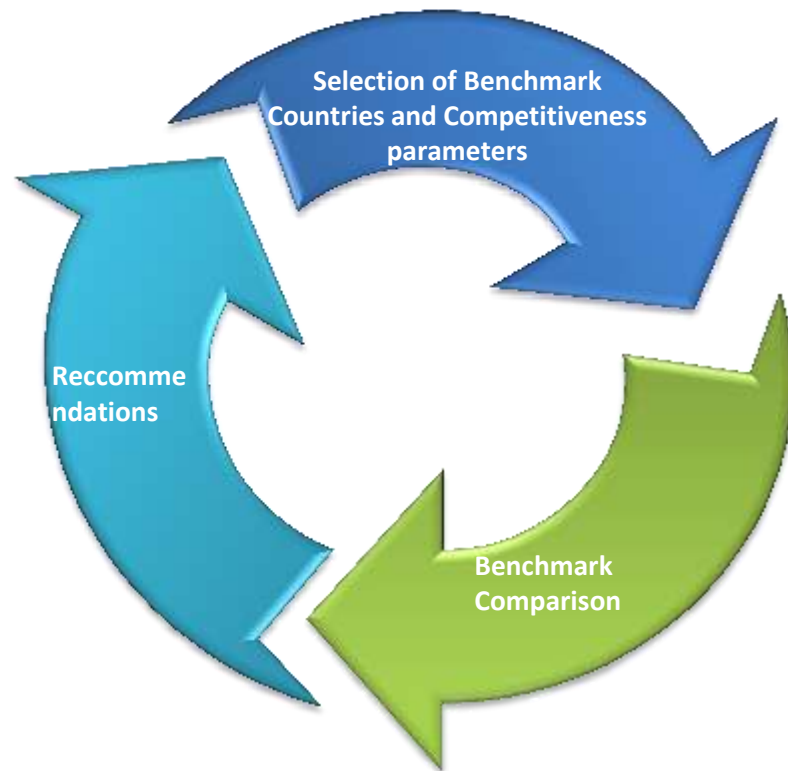
Source: Glass for Europe



The World Bank

Preliminary Conclusions and Next Steps

- The benchmark analysis, which looks at the main competitiveness parameters for the development of the solar industry, **confirms MENA's high potential** to develop this industry.
- Due to the **very heterogeneous nature of MENA countries**, strengths have to be looked at on a country by country basis.
- The next part of the work involves the detailed analysis of those industries which look particularly promising for the different MENA countries, and the **definition of the main axes for an Industrial Development Plan** to develop these component industries.
- As part of the next steps in the analysis, **we invite stakeholders from all countries to comment and participate**.
- The **role and viability of developing a Climate Innovation Center** will be analyzed.





The World Bank

Thank you

Please direct comments and observations to:

menasolarindustry@sta-solar.com

Jorge Servert del Río
jservert@sta-solar.com

José Ramón Alonso
jose.r.alonso@accenture.com